Report On

August, 1966 Oak Mortality Survey Of The Monongahelia National Forest

By

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For

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Division of State And Private Forestry

Northeastern Area

United States Forest Service

Report Prepared: September 11, 1966

Oak Decline - Oak Mortality Survey
Monongahelia National Forest
August, 1966

Introduction:

Reports of field and research personnel in 1965 indicated that large acreages of oak and oak-hickory cover types had been defoliated by insects during May and June of that year. By the time that trained entomologists could visit the involved areas, the insects had completed their "feeding" stage and could not be found and/or identified. Since it was doubtful that such high populations could build up in a single season and since the summers of 1964 and 1965 had both been characterized by a rainfall deficit, it was hypothesized that some trees would die in August of 1965. This hypothesis was based upon the extensive dying of scarlet oak in the Upper Greenbrier Valley during 1953-1956 [1] and upon an analysis of apparently related occurrences in Pennsylvania.[2] In essence, the sequence of events is reported to be defoliation followed by drought which upsets complex physiological balances.[2] Decline and mortality were obvious during the week of August 11, 1965.

At a joint meeting of Federal and State survey officials in the Spring of 1966, it was decided to conduct a State-wide defoliation survey - entomologists from the Delaware, Ohio office were to survey the Monongahelia National Forest and personnel from the West Virginia Forest Insect and Disease Detection Program were to survey State and Private Lands. As far as could be ascertained, surveys were not scheduled for that portion of the George Washington National Forest which lies in West Virginia.

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1. Gillespie, W. H. 1956. Recent extensive mortality of Scarlet oak in West Virginia. Plant Disease Reporter 4(12):1121-1123.

2. Staley, John. 1965. Decline and mortality of red and scarlet oaks. Forest Science 11(1):1-17.

Plans to conduct the survey in late May were hindered by a freeze on May 10th which "stripped" trees over wide areas of the State. Surveys in early June indicated that insects were feeding on the new leaves which, in many cases, were not yet fully expanded. (Typical defoliation as caused by the Oak Leaf Tier (Croesia semipurpurana) on Meadow Creek in Greenbrier County is illustrated on Plate I.)

In late July, the Northeastern Area of the United States Forest Service, through the zone supervisor for Insects and Disease - Mr. Larry Freeman, requested an estimate for an oak decline survey of the Monongahelia National Forest. An estimate of approximately 100 hours for a thorough coverage and 50 hours for a modified coverage were delivered. It was expected that 100 hours would allow for the plotting of every occurrence whereas the modified plan would allow for the location of all sizeable areas, but would not permit the plotting of isolated groups of from one to a few dying trees. A rate of $23 per hour was established for the survey. This fee was to include the plane, pilot, observer, maps and a summary report. Area personnel decided that the less intensive survey would be sufficient.

Materials and Methods:

The survey was initiated on the Callaghan quadrangle on August 11 and terminated on the Monterey quadrangle on August 27th. An evaluation flight was conducted over the area on September 11th to ascertain whether or not the condition had worsened during the interum.

Standard, 15-minute, topographic quadrangles were used during the survey. Accessory grid lines were drawn upon the maps so that there could be some coding of the less concentrated areas where time limitations prohibited specific plotting.

All work was conducted at elevations of approximately 500 feet above the canopy. Low level flying was used to diagnose fire-burned areas, earth slippages, and other phenomena which had or was causing the death of trees. (These acreages were excluded from this report.) Colored aerial photographs were used to acquaint different observers with ocular estimates. Ground checks on State and Private lands were used to justify aerial estimates.

In apparently concentrated areas, a 100 per cent contour survey [3] was attempted. On the remainder of the area, flight lines, running north and south or east and west according to prevailing conditions, spaced at about 1½ mile intervals were used.

The appropriate data was placed on the quadrangle by the observer. The letter "N" was used to signify "none" and F.S.S. was used for "a few scattered trees" or up to about one tree per square mile. The boundaries of concentrated areas were drawn upon the quadrangle and the apparent percentage of the total stand affected was entered beside it. In preparing the maps for this report, a 1 to 5 scale was used as follows:

1. 1 to 5 %.
2. 6 to 10 %.
3. 11 to 25 %.
4. 26 to 50 %.
5. 50 + %.

A few areas along Meadow Creek had up to 80 % of the stand affected. Some large areas on the Marlington and White Sulfur quadrangles were up to 90% in the center of the area and from 70 to 80 % on the margins.

The attached maps depict the oak mortality areas on the Monongahelia National Forest and intercalated lands during August, 1966. The plates illustrate some of the different intensities and conditions that were observed.

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3. Gillespie, W.H. 1965. Oak wilt surveys in West Virginia. Plant Dis. Reptr. 49:173-177.

TABLE I

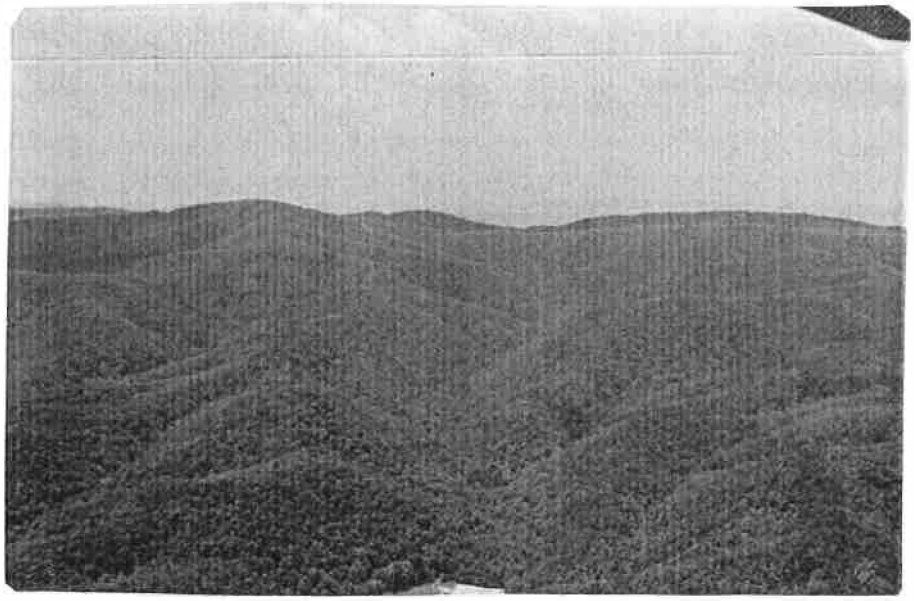
Oak Mortality By Intensification Classes And Quadrangle
Monongahelia National Forest
August, 1966

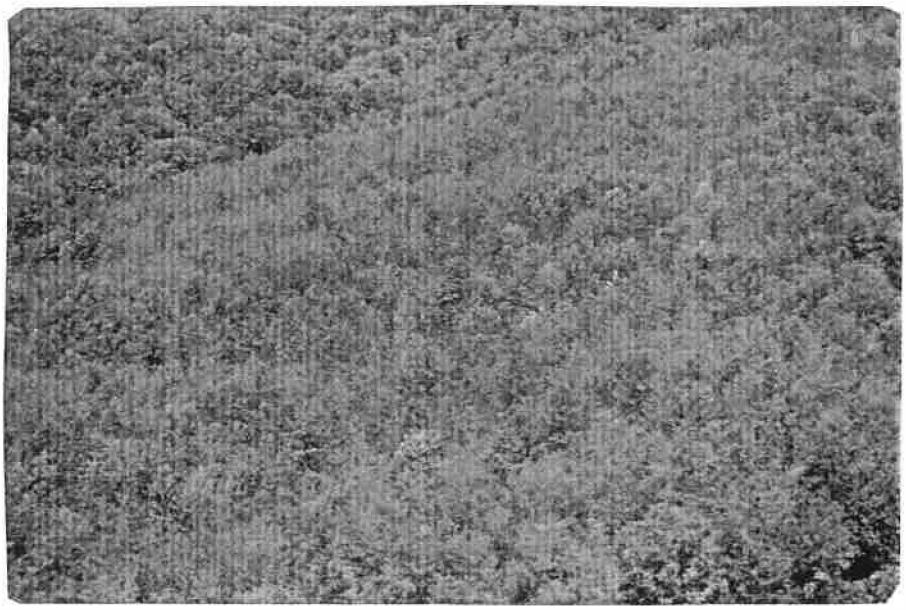
Quadrangle	Total Acreage	Acreages By Per Cent Of Total Stand Affected 1-5%	6-10%	11-25%	26-50%	50+ %
Belington	12	9	3			
Callaghan	1959	293	84	1081	~~300~~ 400	101
Cass	69	32		11	22	4
Circleville	8 FSS					
Cowen	N					
Davis	N					
Durbin	12	12				
Elkins	410	210	30	164		6
Horton	FSS					
Kingwood	FSS					
Lobelia	972		58	52	481	381
Marlington	3307	46	47	603	1762	849
Mingo	22			22		
Monterey	N					
Onego	26	17			9	
Parsons	164	83			75	6
Petersburg	N					
Pickens	N					
Richwood	N					
Spruce Knob	N					
Warm Springs	363		363			
Webster Springs	N					
White Sulfur Sprs.	2325		2	23	671	1629
TOTALS:	~~9651~~ 9641	~~732~~ 702	~~267~~ 587	1956	3420	2976

Comments:

Haphazard observations during the survey indicate that there may be enough white pine reproduction and/or nearby seed sources to recolonize the portions of Meadow Creek watershed affected by oak mortality. This, however, is not the case in the extensive areas along the east side of the Greenbrier River on the Marlington, White Sulfur and Lobelia quadrangles as well as most of the rest of the areas. There exists the possibility that up to three-fourths of the trees on thousands of acres in this area may be dead by 1967. One particularly interesting area is just east of Renick where up to 80 per cent of the trees on nearly 2000 acres are dead or dying. The decline and mortality occurs in essentially the same areas as was mapped during the defoliation survey of 1966. The Meadow Creek areas are known to have been defoliated initially in 1965.

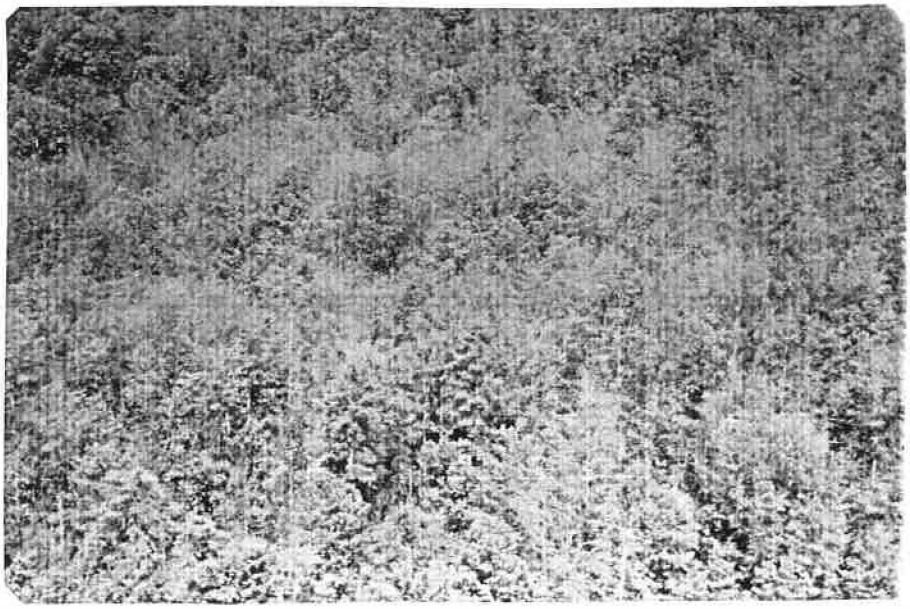
Mortality Not Evident. Some Defoliation And Frost Noticeable.



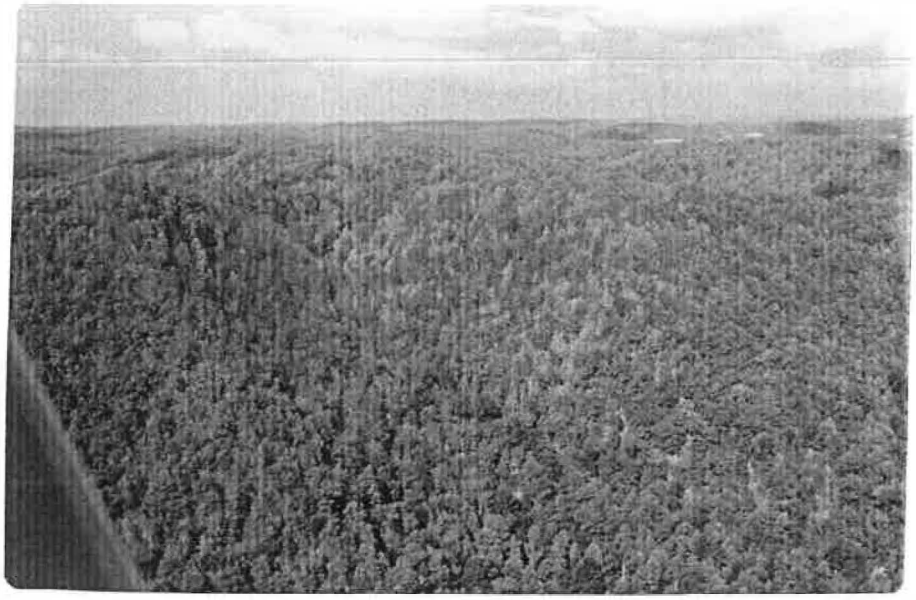


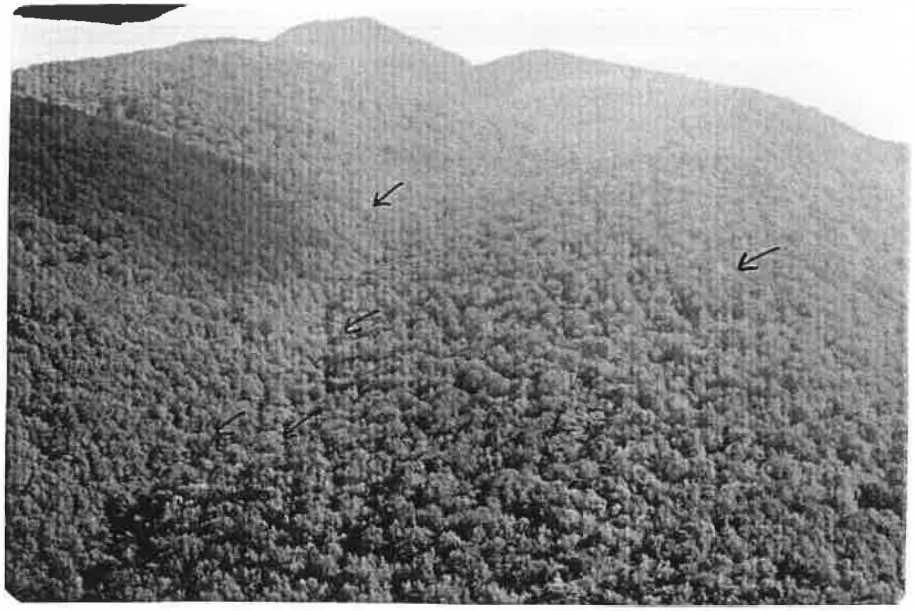
Defoliation by Oak Leaf Tier (*Croesia semi-purpurana*) on Meadow Creek. June, 1966

Close-up of Above Area.



Mortality
Caused By
Forest Fire.

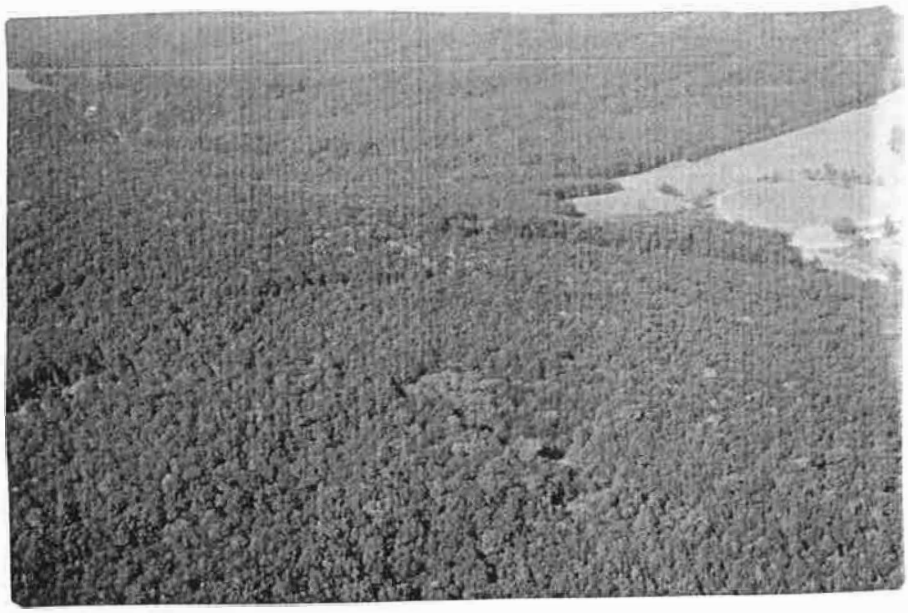


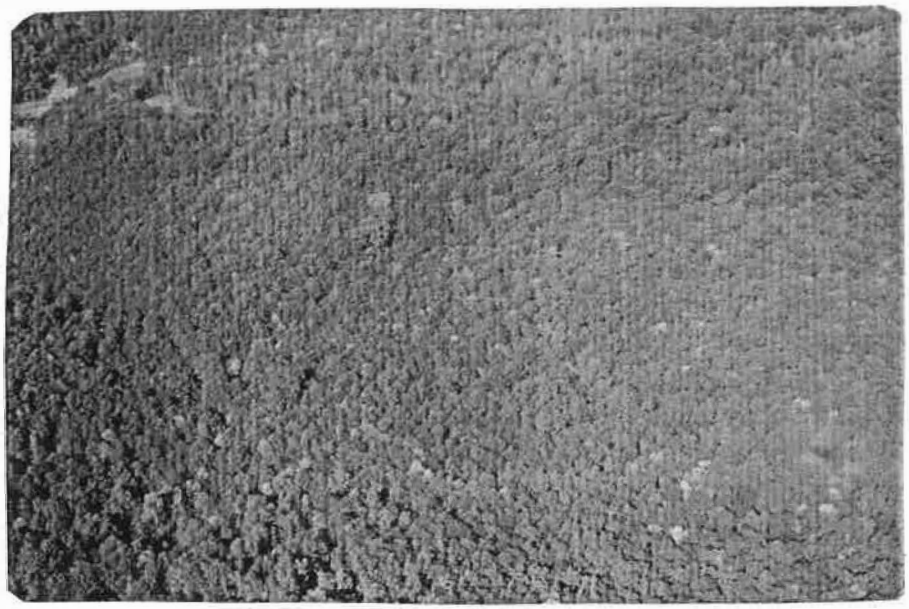


Few Scattered
Trees.

Up to One Per
Square Mile.

Perhaps As Many
As One Per Acre.





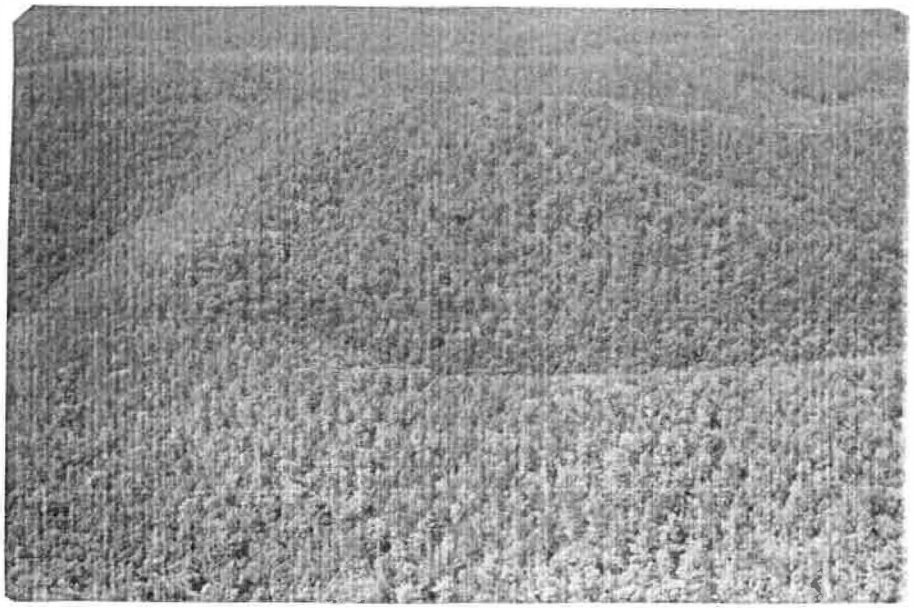
One to Two Per
Cent.

Six to Ten
Per Cent. Note
Ones Just
Starting.

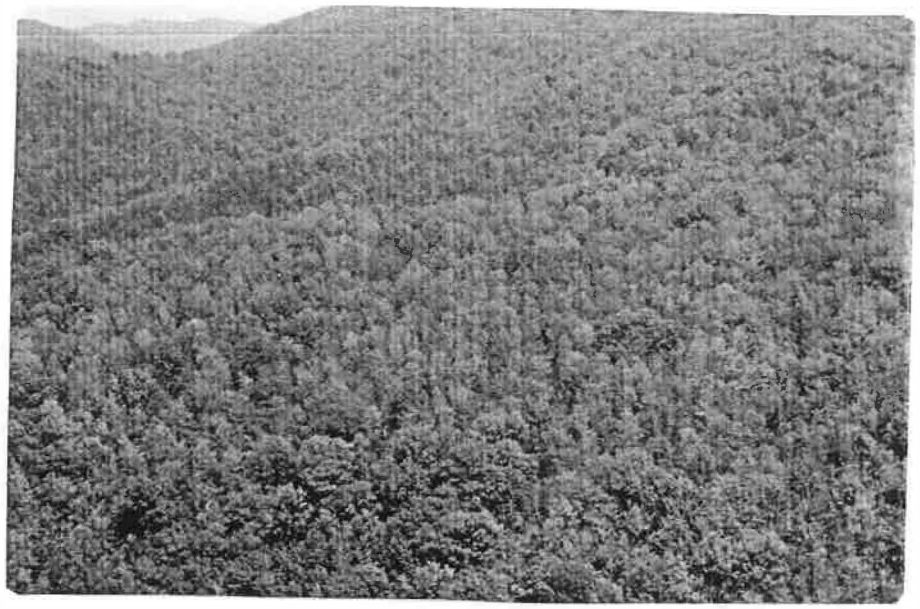
Ten to Twenty-Five Per Cent. Note Totally Dead Trees.

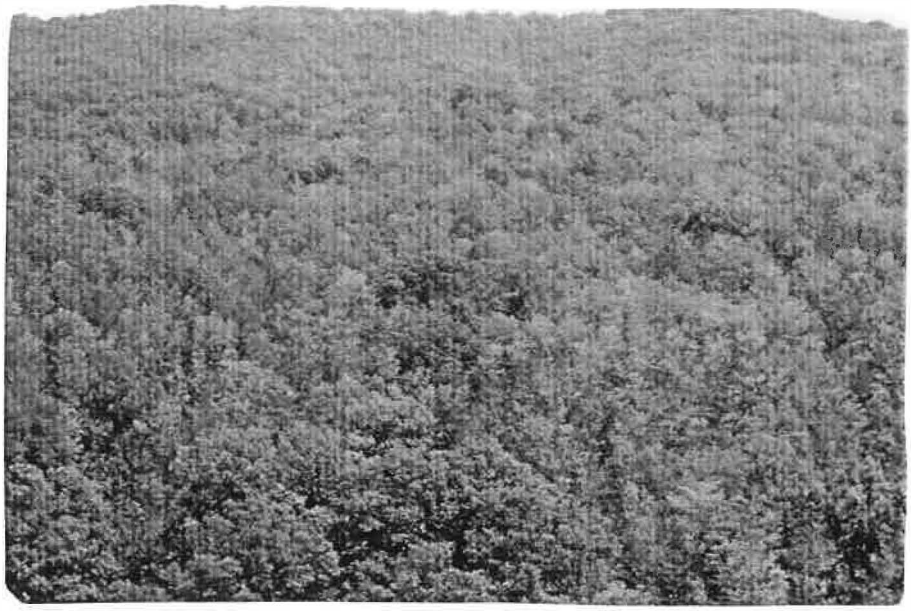
Twenty-Six to Fifty Per Cent. Note White Pine.

High Altitude View of Twenty-Six to Fifty Per Cent.



Fifty Per Cent.

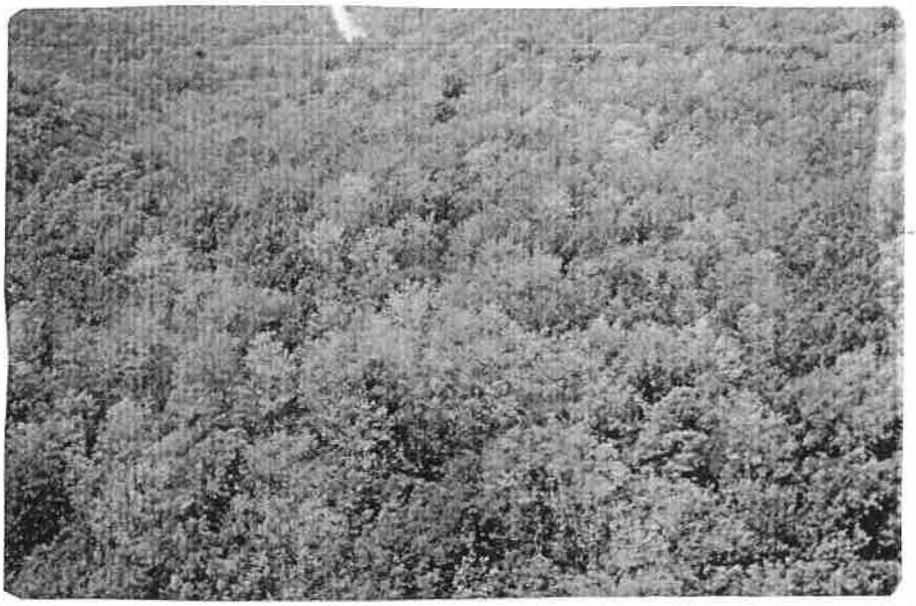


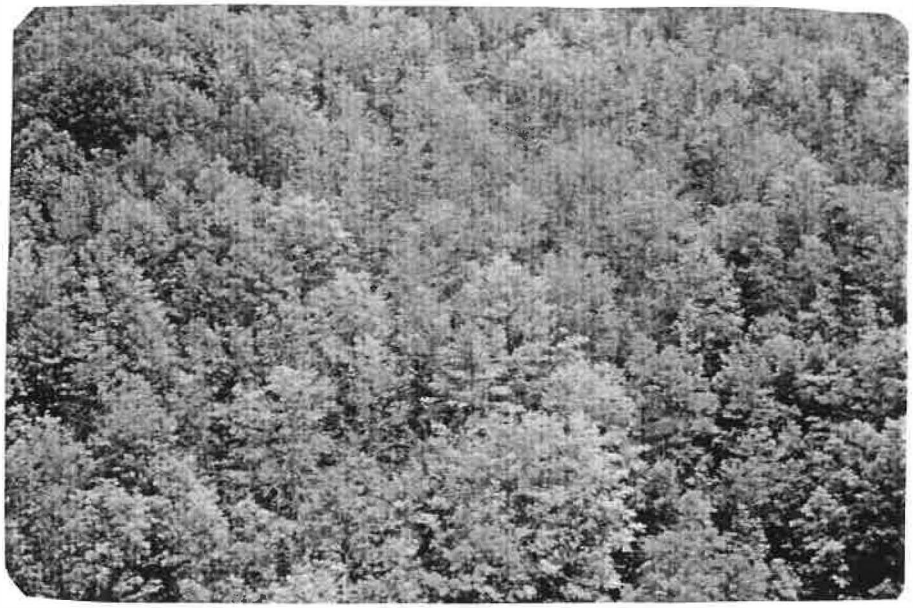


Fifty Per Cent.

Fifty Per Cent.

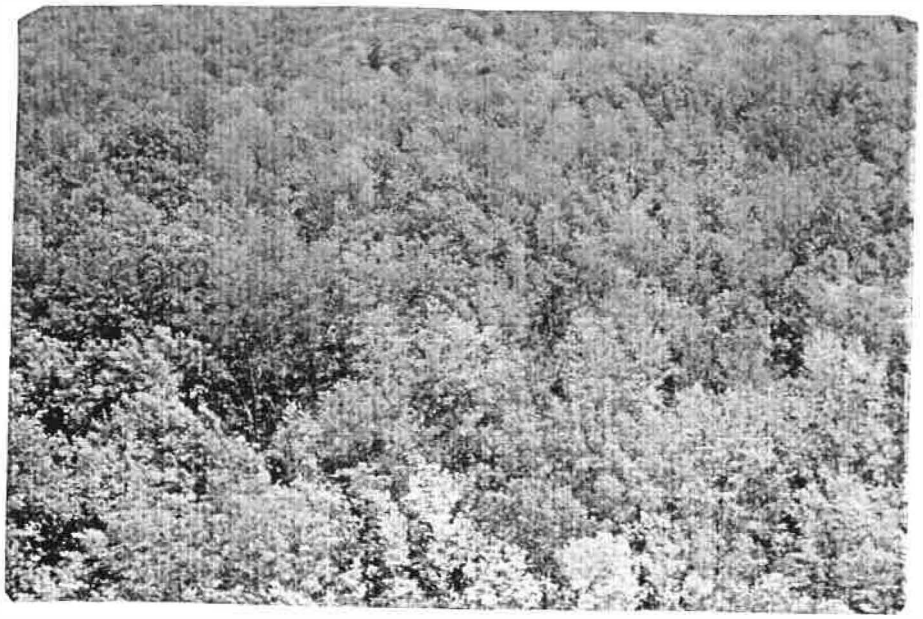
Another View of About Fifty Per Cent. Many Areas Are Much Harder Hit.



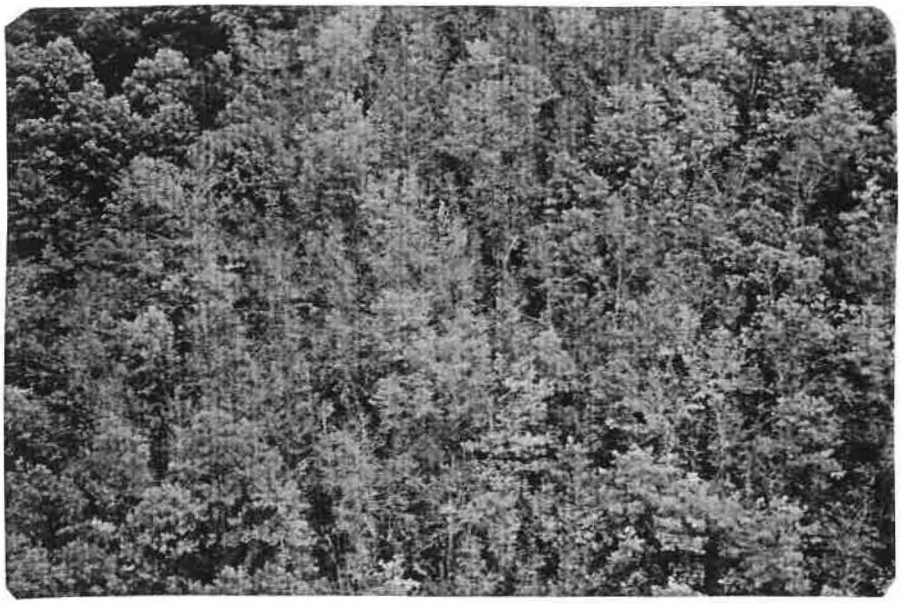


General View.

General View.

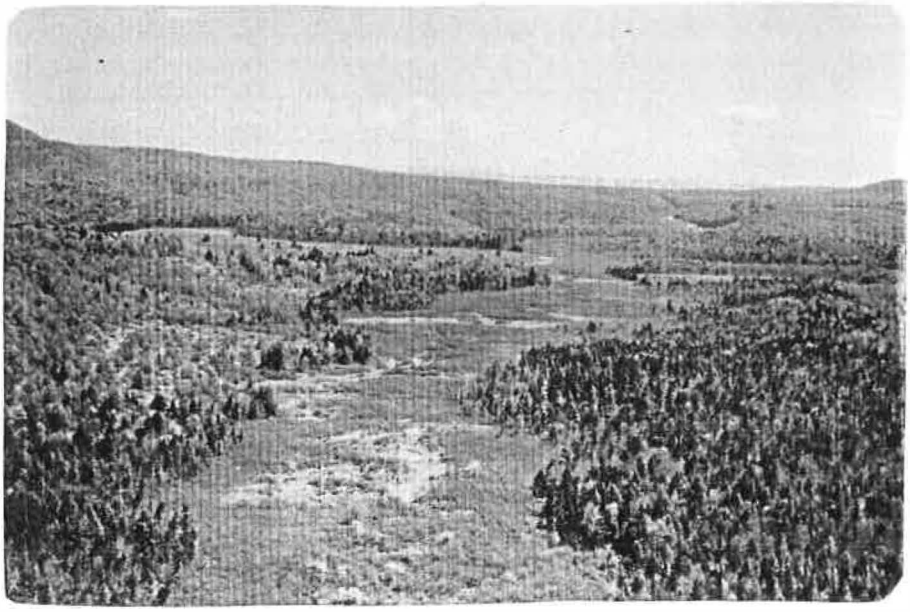


Close-Up Showing Dead And Dying Trees.



Close-Up Showing Dead And Dying Trees.

One Area Where Decline Was Not Noticeable. The Shot Is Of Cranberry Glades. Actual glades are in upper part of photo.



STATE OF WEST VIRGINIA

DEPARTMENT OF AGRICULTURE

CHARLESTON 5

Gus R. Douglass
Commissioner

September 11, 1966

Mr. Larry Freeman, Entomologist
Northeastern Area, U.S.F.S.
Forest Insect and Disease Laboratory
Delaware, Ohio.

Dear Larry:

I am enclosing duplicate copies of the report for the 1966 oak decline and oak mortality survey of the Monongahelia National Forest . I am not enclosing the financial statement which will be prepared next week. In case you are interested, nowevery a rough estimate is 51 hours at $23 per hour or a total of $1173. This should be a maximum figure. The actual cost may be somewhat lower.

I apologize for the brevity of the report, but circumstances are such that the necessary additional time is not presently available. I am sorry also that funds were not available to do a really thorough job as we may have been able to estimate what is to be expected next year by a closer perusal of the lightly affected areas.

We really appreciate the opportunity given us to survey the M.N.F. If we can be of service in future years, just let us know.

The results of the Statewide survey will be reported in some detail in a forthcoming issue of the Plant Disease Reporter.

Sincerely,

W H Gillespie

William H. Gillespie
Asst. Director, Pest Control Services

WHG:whg

Enclosures